CLAIMS

What is claimed is:

1 1. A method of storing data into a database, the method comprising:

2 a client application receiving data;

3 determining one or more routines that are associated with a type of said data, wherein

4 said one or more routines are implemented by a program that is external to

5 both said client application and a database server that manages said database;

6 in response to said one or more routines being invoked, said program performing

7 steps comprising:

8 determining one or more first values that are specified in said data, wherein

9 said one or more first values correspond to one or more attributes of

10 said type; and

11 determining one or more second values that correspond to one or more hidden

12 columns of one or more tables in said database;

13 generating, based on said one or more first values and said one or more second

14 values, a data stream that conforms to a format of data blocks of said

15 database; and

16 writing said data into one or more data blocks in said database.

1 2. The method of Claim 1, further comprising:

2 in response to said one or more routines being invoked, said program performing

3 steps comprising:

4 creating a data structure that comprises:

5   one or more first elements that correspond to said one or more

6   attributes; and

7   one or more second elements that correspond to said one or more

8   hidden columns;

9   populating said one or more first elements with said one or more first values;

10   and

11   populating said one or more second elements with said one or more second

12   values;

13   wherein said generating of said data stream is based on said data structure.

1   3.   The method of Claim 2, wherein said data structure is created in memory that is

2   associated with said client application.

1   4.   The method of Claim 1, wherein at least one of said one or more second values is

2   associated with said one or more first values and distinguishes said one or more first

3   values from other values in said data.

1   5.   The method of Claim 1, wherein at least one of said one or more second values

2   describes a position of said one or more first values relative to other values in said

3   data.

1   6.   The method of Claim 1, wherein a number of attributes of said type is not defined to

2   said client application.

1   7.   The method of Claim 1, wherein a type of an attribute of said type of said data is not

2   defined to said client application.

1   8.   The method of Claim 1, wherein said generating and said writing are performed

2   without causing a Structured Query Language (SQL) engine to load said data.

1   9.   The method of Claim 1, wherein determining said one or more routines comprises

2   locating addresses of one or more routines that are in a same entry as an identity of

3   said type.

1   10.   The method of Claim 1, further comprising:

2   adding, to a table, an entry that indicates an association between said type and said

3   one or more routines.

1   11.   The method of Claim 1, further comprising:

2   invoking one or more routines that are located at one or more addresses that are

3   associated with said type.

1   12.   A method of storing data into a database, the method comprising:

2   a client application receiving data that conforms to a first type definition that

3   indicates one or more first attributes, wherein at least one of said one or more

4   first attributes is of a type that is defined by a second type definition that

5   indicates one or more second attributes;

6   determining one or more first routines that are associated with said first type

7   definition, wherein said one or more first routines are external to both said

8   client application and a database server that manages said database;

9   in response to one or more calls to said one or more first routines:

10   creating a first data structure with one or more first elements that correspond

11   to said one or more first attributes; and

12   populating said one or more first elements with one or more first values that

13   are specified in said data, wherein said one or more first values

14   correspond to said one or more first attributes;

15   in response to one or more calls to one or more second routines that are associated

16   with said second type definition:

17   creating a second data structure with one or more second elements that

18   correspond to said one or more second attributes; and

19   populating said one or more second elements with one or more second values

20   that are specified in said data, wherein said one or more second values

21   correspond to said one or more second attributes;

22   generating, based on said first data structure and said second data structure, a data

23   stream that conforms to a format of data blocks of said database; and

24   writing said data into one or more data blocks in said database.

1   13.   The method of Claim 12, further comprising:

2   generating a set identifier that is associated with one of said one or more first

3   elements; and

4   populating a plurality of elements in said second data structure with said set identifier.

1   14.   A computer-readable medium carrying one or more sequences of instructions which,

2   when executed by one or more processors, causes the one or more processors to perform the

3   method recited in Claim 1.

1   15.   A computer-readable medium carrying one or more sequences of instructions which,

2   when executed by one or more processors, causes the one or more processors to perform the

3   method recited in Claim 2.

1   16.   A computer-readable medium carrying one or more sequences of instructions which,

2   when executed by one or more processors, causes the one or more processors to perform the

3   method recited in Claim 3.

1   17.   A computer-readable medium carrying one or more sequences of instructions which,

2   when executed by one or more processors, causes the one or more processors to perform the

3   method recited in Claim 4.

1   18.   A computer-readable medium carrying one or more sequences of instructions which,

2   when executed by one or more processors, causes the one or more processors to perform the

3   method recited in Claim 5.

1   19.   A computer-readable medium carrying one or more sequences of instructions which,

2   when executed by one or more processors, causes the one or more processors to perform the

3   method recited in Claim 6.

1   20.   A computer-readable medium carrying one or more sequences of instructions which,

2   when executed by one or more processors, causes the one or more processors to perform the

3   method recited in Claim 7.

1   21.   A computer-readable medium carrying one or more sequences of instructions which,

2   when executed by one or more processors, causes the one or more processors to perform the

3   method recited in Claim 8.

1   22.   A computer-readable medium carrying one or more sequences of instructions which,

2   when executed by one or more processors, causes the one or more processors to perform the

3   method recited in Claim 9.

1   23.   A computer-readable medium carrying one or more sequences of instructions which,

2   when executed by one or more processors, causes the one or more processors to perform the

3   method recited in Claim 10.

1   24.   A computer-readable medium carrying one or more sequences of instructions which,

2   when executed by one or more processors, causes the one or more processors to perform the

3   method recited in Claim 11.

1   25.   A computer-readable medium carrying one or more sequences of instructions which,

2   when executed by one or more processors, causes the one or more processors to perform the

3   method recited in Claim 12.

1   26.   A computer-readable medium carrying one or more sequences of instructions which,

2   when executed by one or more processors, causes the one or more processors to perform the

3   method recited in Claim 13.